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OVARIOTOMY.[1]

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I. — Mrs. M. was recommended to me by Drs. Inman and Milliken, of Cherryfield, Me. The patient is forty-six years old, was married one year ago, has never been pregnant; menstruation, irregular for four years, last occurred in September, 1874. The size of her abdomen has been gradually increasing for two years; this increase was recognized eighteen months ago as due to the presence of a tumor. Of late there has been much suffering from back-ache, and especially from pain in the left side of the abdomen. The bowels have been constipated.

Four brothers have died of phthisis, as have many cousins. The patient has been an invalid all her life. When fourteen years old she fell and injured her spine.

The girth at the umbilicus is forty-one and three fourths inches. On percussion there is flatness throughout the abdomen, except in the right lumbar region, where there is tympanitic resonance. Fluctuation is uninterrupted in all directions. The abdomen is symmetrically distended. The abdominal walls, although tense, are freely movable over the tumor. The uterus is retroverted, and quite movable independently of the tumor. The latter does not extend into the small pelvis, and can with difficulty be reached per vaginam. Fluctuation bimanually is uninterrupted. There is slight undue prominence of several dorsal vertebræ.

Diagnosis. — Unilocular ovarian cyst, with no solid part and no adhesions. This was corroborated on the next day by Dr. G. H. Lyman.

Prognosis. — Four chances of recovery out of five.

Precautions against infection were very many and minute: A house in Somerville surrounded by a garden; a large sunny room never previously occupied by a sick person; a new top mattress; an open fire; a trustworthy nurse who had been disengaged for five weeks, in a freshly-washed dress; no spectator admitted who had attended any infectious disease, suppurating wound, or autopsy for the week previous; Dr.

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[1] Read before the Suffolk District Medical Society, January 30, 1875.

Lyman, on whom I relied as an assistant, was not accepted, owing to an inflamed matrix on one finger; new sponges; all instruments boiled, and subsequently washed in a solution of permanganate of potash; hands of operator and of assistants washed in the same solution. I abstained from visiting any but perfectly innocuous patients for two weeks before operating.

Operation on January 16, 1875, with the assistance of Drs. J. Homans and A. H. Nichols, in the presence of Drs. G. H. Lyman, J. N. Borland, W. E. Boardman, and G. H. Bixby. Ether was administered by Mr. Fletcher Abbott.

Incision in linea alba three inches long. Cyst evacuated with Wells's trocar and rubber tube. Diagnosis verified; single cyst, no adhesions, no solid part. Right ovary and uterus healthy. Pedicle, rather short and broad, was secured by the Wells clamp and then divided. One end subsequently slipped, and bled to the extent of one ounce, into the peritoneal cavity. It was secured, and the clamp readjusted. Four silk sutures above and one below pedicle. End of pedicle carbonized with solid perchloride of iron. Wound dressed with dry lint. Abdomen supported by cotton-wool, secured by long strips of adhesive plaster. Tumor contained eleven and one half quarts of a thin fluid, and weighed twenty-five pounds.

After-Treatment. — No vomiting from ether. As there was no shock, or loss of blood during the operation, as there was no danger of subsequent hæmorrhage, suppuration, and consequently of pyæmia, septicæmia, or other complication which would make a demand upon her strength, the usual stimulating treatment was not carried out. The predominant indication was to avert the peritoneal inflammation by diminishing the intensity of the reaction, and by the prevention of vomiting. In the impossibility of securing a specially trained nurse in this country, I passed every night for a week in the house, and never left my patient by day for more than two hours at a time. Till the fifth day her only diet was ice and soda-water; a little beef-tea given on the second day was vomited at once, and my wavering resolution to persist in the light diet was strengthened. She had brandy (one drachm) on two occasions, to relieve epigastric distress. A troublesome cough was allayed by a chloroform mixture. The temperature fluctuated between 99° and 100.4°, and returned to the normal on the twelfth day. The pulse was never over 120. The last stitch was removed on the sixth day. The wound gaped superficially on either side of the pedicle. The clamp produced quite a deep slough in both flaps by pressure, and was removed on the eleventh day by division of the sloughing remnants of the pedicle. Distressing flatulence was relieved by enemata. The bladder was emptied every few hours with the catheter for several days. Six grains of quinine were given daily after the first week. The patient moved to the lounge on the sixteenth day. The wound was still suppurating and rather deep, but contracting rapidly.

The patient returned to her home in Maine two months after the operation. She had then nearly regained her usual health and strength. The incision had completely healed. She was rather constipated, and occasionally suffered from abdominal pains. These latter were unquestionably due to traction upon the pedicle. On vaginal examination the uterus, which at the operation had been brought with its left side apposed to the abdominal incision, had resumed the erect position, though its fundus was still firmly united to the upper end of the incision. On passing the uterine sound, the internal os and whole uterine cavity were found to be exquisitely tender. Laxatives, warm hip baths, and time were prescribed to relieve these conditions.

Spencer Wells has shown conclusively that attention to all the minutiæ above recorded, and incessant personal supervision of the after-treatment, have a very decided influence upon the result.

THE PHYSIOLOGICAL ACTION OF THEBAIN.

BY J. OTT, M. D., OF EASTON, PA.

THE alkaloids of opium at present as far as discovered are as follows: morphia, narcotina, codeia, thebain, narcein, pseudomorphia, papaverina, cryptopia, opianin, metamorphia, codamin, hydrocotarnia, lanthopin, laudanin, laudanosia, meconidin, and protopin. There are seventeen alkaloids and two organic acids. Apomorphia and codamin are derivatives, the first of morphia, the second of narcotin.

Thebain, or paramorphia, was discovered by Pelletier and Thiboumery in 1832. Couërbe obtained from forty pounds (livre) of opium fifty ounces of morphia, one and a half ounces of codein, one ounce of thebain, one ounce of meconin, and six drachms of narcein. Merck found in Bengal opium eight per cent. of morphia, three per cent. of narcotin, one per cent. of thebain, one half per cent. of codein, and a trace of meconin.

Magendie [1] first made physiological experiments with thebain. He found that one grain (probably the acetate), injected into the jugular or into the pleura, tetanized and killed dogs.

Orfila experimented with the nitrate (?) of thebain on dogs. In the first experiment ten centigrammes of the salt with twelve grammes of water were introduced into the jugular of a dog having fasted a long time. The animal soon made a deep inspiration, and fell into opisthotonos with convulsive movements, which lasted a few seconds. After a minute the walk of the dog was vacillating, as though he was intoxicated, but no paralysis of the posterior extremities was perceived. Drowsiness was also present. After ten minutes the animal began to recover, and next day was quite lively. In the second experiment Orfila injected into the jugular vein of a moderately strong dog a solution of thirty-five centigrammes of nitrate (?) of thebain in twenty grammes of water. Before the end of the injection, opisthotonos and convulsive movements ensued. After many curious movements the animal recovered in about twenty minutes.

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[1] Das Thebain: Eine Monographie. F. W. Müller, Marburg. 1868.

Albers made two experiments on frogs, with thebain in crystallized form. He gave one half and three fourths of a grain subcutaneously. The toxic action appeared slowly. Convulsive cramps were observed, and death took place after a considerable time. Müller thinks that Albers used another alkaloid, probably caffein, but I see no very good reason to doubt Albers's observations.

Bernard experimented on dogs, cats, rabbits, guinea-pigs, rats, pigeons, sparrows, and frogs. He found thebain the quickest convulsivant, and, other things being equal, the most deadly toxicant, compared with the five alkaloids, codein, morphia, narcein, narcotin, and papaverin. He states that a dog of seven to eight kilogrammes in weight died when one tenth of a gramme of thebain in the shape of a muriate was injected into the blood. He further states that thebain caused not only convulsions but stoppage of the heart, and quickly ensuing rigor mortis.

Baxt[1] made a difference between large and small doses as regards effects on frogs. By the subcutaneous injection of about .00075 of a gramme of thebain dissolved with hydrochloric acid and water, there ensued at first excitation for a minute, followed by rest; in three to six minutes a comatose state, in which only strong irritation brought out a single reflex contraction, and after twelve to eighteen minutes a state similar to that induced by strychnia — spontaneous cramps, and a heightened excitability lasting from three to six hours. These appearances could be brought out when the dose was repeated on the same day or on successive days. Frogs which had received .00225 of a gramme and .0045 of a gramme subcutaneously, had reflex tetanus at first, which became spontaneous, and the animals died in from two to six hours. When six or seven thousandths of a gramme were introduced subcutaneously in rabbits, in fifteen to twenty-five minutes strong tetanus was produced, usually ending in death. The same dose caused strong excitation in guinea-pigs. In frogs thebain contracted the pupil, then enlarged it, and after one to two hours contracted it considerably. It increased the frequency of the heart-beats.

Müller used the muriate of thebain in watery solution on frogs, pigeons, rabbits, and dogs. In a medium-sized dog, one tenth of a gramme under the skin was not deadly, but it became so after a period of seventeen minutes when injected into the jugular vein. The subcutaneous injection of .005 of a gramme subcutaneously in rabbits had no effect, but when received into the jugular, tetanus ensued but not death. Doses varying from one tenth of a gramme to two grammes, subcutaneously, produced death in three experiments on rabbits in twenty-one, eight, and six minutes. Four hundredths of a gramme of thebain produced in a pigeon tetanic cramps at the end of six minutes, whilst five hundredths and one tenth of a gramme produced death in different pigeons at the end of four, seven, and eleven minutes. Müller concludes that, other things being equal, pigeons have a greater resistance to the poison than rabbits. He saw very small quantities of it produce tetanus in frogs, and stand-still of heart. When excised frogs' hearts are placed in a weak solution of thebain and in distilled water, the beats of the hearts in the thebain solution decrease in number more rapidly, and cease earlier. Müller infers that morphia and thebain are not antagonistic in action. Crum Brown, and Fraser saw twelve thousandths of a gramme of thebain, dissolved in very dilute hydrochloric acid and introduced subcutaneously, kill a rabbit in forty-four minutes, the symptoms previous to death being absence of a desire to move, contractions of the muscles about the spine, and opisthotonos; twenty-four hundredths of a gramme in the same form, when given by the stomach, caused tetanus and death in nineteen minutes. Rigor mortis and acid reaction of the muscle appeared, and the sciatic nerves were irritable fifteen minutes after death. Harley has seen a dog die when two grains were used hypodermically, and mice succumb from the use of one half to one twentieth of a grain. Mitchell[1] found that a grain of paramorphia (Powers and Weightmann's article), partially dissolved, caused death in a pigeon, in two minutes, attended with tetanus, and that one third of a grain dissolved in thirty minims of acidulated water produced death, accompanied by vomiting and tetanus, in one minute and a half. Rabuteau[2] injected subcutaneously, in a dog, five centigrammes of thebain dissolved by a drop of muriatic acid, and the only symptom was stamping on the ground with the feet. In another dog, fifteen to twenty centigrammes dissolved in five cubic centimetres of water, given in the same way, caused symptoms similar to those by strychnia, followed by death. The pupils were slightly contracted. Rabuteau also saw thebain in small doses cause convulsions and death in frogs. He has taken, at one time five centigrammes, and at another time ten centigrammes of thebain, dissolved in hydrochloric acid, with subsequent ingestion of a hundred grammes of water. After the dose of ten centigrammes, the only symptom was some cerebral trouble, such as ebriety without headache; there was no action on the pupil, pulse, appetite, or urinary secretion.

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[1] Husemann, Die Pflanzenstoffe.

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[1] American Journal of the Medical Sciences, January, 1870.

[2] Journal de l'Anatomie et de la Physiologie, No. 3, 1872.

Ozanam[1] states that thebain therapeutically agitates and even tetanizes, with slight predisposition to sleeplessness; it excites tetanus principally in the upper limbs (a fact noticed by Orfila in a dog), suggesting that it may be beneficial in paralysis of those parts. Three to six centigrammes in a paraplegic patient caused so much general uneasiness and excitation, especially of the upper extremities, that the remedy was discontinued. Schroff thinks that therapeutically thebain is worthless. Reissner saw no narcotic symptoms from it. The observations of Eulenberg coincide with those of Ozanam that it acts especially on the cervico-dorsal part of the spine. He found that the subcutaneous use of the muriate of thebain in doses of twelve thousandths to four hundredths of a gramme, by several patients, increased the temperature and the number of pulsations and respirations with no symptoms of intoxication. In a few cases wide dilatation of the pupil was noticed. The drug had neither hypnotic nor analgesic effect, nor action on diarrhœa. Rabuteau, by the method of Moreau, found that thebain does not prevent exosmosis. He concludes that thebain is convulsivant and toxicant, not soporific, but increases the action of chloroform and is analgesic.

Having given a general *résumé* of the knowledge on this subject, I will relate my own experiences. All my experiments were made with Merck's thebain. One cubic centimetre of the solution equaled one hundredth of a gramme of the poison dissolved by hydrochloric acid, the solution being absolutely neutral. As it will be inconvenient to present a complete tabular statement of experiments, I will give only enough to illustrate my statements.

GENERAL ACTION.

Experiment I. — Frog at 1.23 P. M. received .01 gramme of thebain subcutaneously. At first frog hops away, then sits still; pupil contracted, respiration less frequent. 1.29 P. M. Tetanus excited by touch; medulla severed, but tetanus persists till death at 2.10 P. M.; heart beat s eighteen per minute.

Experiment II. — Frog at 9.32 A. M. received .00075 gramme of thebain subcutaneously. At first hops away, then remains quiet. 9.37 A. M. Pupils become smaller. 10.56 A. M. Tetanus, which continued during the afternoon; at length fully recovered.

Experiment III. — A pigeon of moderate size received under the skin of the thigh .01 gramme of thebain at 2.45 P. M. At first the bird flew about the laboratory, then showed signs of excitation. 2.52 P. M. Fell from his perch in a tetanic state, which continued at frequent intervals till 2.58 P. M., when death ensued. When the chest was opened, the heart was not beating.

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[1] G. B. Wood's Therapeutics.

From the above experiments it is seen that thebain is a tetanizing agent, even in as small doses as .00075 of a gramme; that the seat of the convulsions is not cerebral; that pigeons do not have a special immunity against it, as was demonstrated by Mitchell[1] in the case of morphia.

ACTION ON THE NERVOUS AND MUSCULAR SYSTEMS.

In all cases of poisoning by thebain the functions of the sensory nerves remain unimpaired till death, as the convulsions are always excited by touch up to that period. In studying the action on the sensory nerves I made use of the method described by Von Berold and Bloebaum.[2] In a few words the method is as follows. The reflex contractions of a frog, feebly under the influence of strychnia, afforded an index of sensory excitation, as used by Pflüger.[3] The main arteries of the hind legs were previously tied, and these extremities so severed that their only connection with the body was by the sciatic nerves. One nerve was covered with cotton saturated with two and a half per cent. solution of phosphate of soda, and to the other a two and a half per cent. solution of muriate of thebain was applied in the same manner. Two watch-glasses were the sources from which the cotton received sufficient solution to be always thoroughly saturated. By means of a support and a rubber ring four pairs of platinum electrodes were adjusted in such a way that by means of commutators the central or the peripheral parts of the nerves, *i. e.*, the parts above and below the points of application of the drugs could be irritated separately at will. In all details the method as fully described in places referred to was followed; the results of this method can be judged of only in a general way, as the physical laws of the osmosis of the poisons are not made out as regards the nerves.

S. C. means the central end and S. P. the peripheral end of the nerve soaking in the soda solution. T. C. means the central end and T. P. the peripheral end of the nerve saturated with the thebain solution. The numbers under these letters denote the distance between the primary and secondary coils at which the central or the peripheral part of the nerve is sufficiently irritated to respond by a reflex contraction.

Experiment I.

Time.	S. C.	S. P.	T. C.	T. P.
A. M. 11 5	27	27	25	21
11 10	28	28	20	27
11 30	24	28	22	20
11 40	25	24	13	15
P. M. 1 35	15	10	12	12
2 12	17	11	11	11

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[1] American Journal of the Medical Sciences, January, 1870. Opium and its Derivative Alkaloids.

[2] Von Berold, Untersuch aus dem physiologischen Laboratorium in Würzburg, erstes Bleft, page 21.

[3] Untersuch aus dem physiologischen Laboratorium zu Bonn.

From the figures in the above table it will be seen that the nerve to which thebain was applied was in general less irritable than that treated with phosphate of soda, but, owing to the irregularities shown in the last two columns, it would be unsafe to attribute this diminished irritability to a specific action of the drug upon the sensory nerve trunks. I have also made use of the beautiful method of Brown-Séquard [1] by cutting off the action of the poison on the lower segment of the spine and sending it to the peripheral terminations of the nerves going to this segment.

Experiment II. — Frog has cord cut at origin of nerves of anterior extremities and the spinal branches of the aorta severed. Then .0025 of a gramme of thebain was injected under the skin of the lower jaw at 10.45 A. M. At 10.52 A. M., tetanus of the anterior extremities occurred; posterior extremities are withdrawn when pinched. 11.22 A. M. No tetanus of posterior extremities, although anterior extremities are tetanized.

In the following experiment the poison is cut off from the peripheral ends of the nerves of the posterior extremities, but is allowed to go to the spinal cord.

Experiment III. — Frog at 10.28 A. M. had aorta tied above its bifurcation, and .0025 of a gramme of thebain injected under the skin of the lower jaw. 10.31 A. M. Tetanus in all extremities; no distinguishable preference shown.

The following experiment shows the local action of thebain when applied to the spinal cord.

Experiment IV. — Frog has cord cut at the origin of the brachial plexus, and spinal arteries of aorta severed; .0025 of a gramme of thebain was gently injected into the spinal canal of the lower segment, when tetanus ensued, lasting a minute and a half, after which all reflex action in posterior extremities was lost.

The action of the poison on the peripheral end of the sciatic nerve on one side can also be studied by the method of Bernard, as is shown in the following experiment.

Experiment V. — Frog has right iliac artery and vein tied. At 9.7 A. M. he received .015 of a gramme of thebain. 9.11 A. M. Tetanus. 9.12 A. M. Again .015 of a gramme injected; pupil contracted. 10.4 A. M. No sign of life; sciatic nerve on sound side responds at fifty centimetres of Dubois's coil, sciatic nerve on poisoned side responds at forty-five centimetres; no reflex action on irritating either central end of the sciatics; thrusting an instrument down the spine elicits a few very slight twitches in the femoral muscles.

It is evident from the above experiments that the action of the poison on the sensory and motor nerves is nothing at all. Now the question arises, Where is the seat of the tetanus? It has already been proved that it is non-cerebral. As for every reflex action we must have a sensory nerve, a ganglion, a motor nerve, and a muscle, the seat of this tetanus must be in either one or more of the above elements. The method of Brown-Séquard shows that the action of the poison on the sensory termination will not produce tetanus, and Experiment V. proves that the excitability of the motor nerves certainly is not exaggerated by it; so that it is necessary to conclude that the action must be either in the ganglion or the muscles. But there is no action on the muscles, for as division of the sciatic stops convulsive action in that extremity, and repeated observations of muscle curve gave me wholly negative results. The action of the muscle was studied by means of Pflüger's myograph. I first severed the medulla, destroyed the spinal cord, and took a curve of the gastrocnemius indirectly and directly in situ. Then the frog was poisoned by subcutaneous injection of thebain, and curves of same muscle taken at different periods for an hour or two. All curves were registered on Ludwig's registering apparatus.

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[1] Thèse pour le Doctorat en Médecine par F. W. Bonnefin.

The following form will express my conclusions as to the action of thebain on the nervous system: —

1. Thebain is a spinal convulsivant.
2. It has no action either on the sensory nerves, the striated muscles, or the motor nerves.
3. Like strychnia, it tetanizes by excitation of the spinal ganglia.

ACTION ON THE CIRCULATION.

The experiments on the circulation were twenty-six in number, and were made on rabbits. The pulse and pressure were noted by Ludwig's mercurial manometer on a continuous roll of paper, whose rapidity of movement was noted by an electro-magnet in connection with a pendulum swinging seconds. By a special contrivance the beginning and end of the injection were noted on the paper. A branch of the jugular or the jugular itself furnished the means for the introduction of the poison, which was always injected towards the heart, no air being allowed to enter. Artificial respiration, similar to the normal, was kept up by an apparatus on the principle of Sprengel's blower, the current being broken at regular intervals by a revolving stop-cock. Curare was used to prevent the effect of the tetanus on the circulation. The carotid artery was used for manometrical observations. The pressure of the blood is given in millimetres of mercury, and the pulsations for periods of thirty seconds.

Experiment I. — Rabbit, curarized.

Time.	Pulse.	Pressure.
	134	96
	Thebain, .005 gramme.	
P. M. 1 20	142	134
1 20 30	138	126
1 21	140	118
1 22	135	144
1 30	118	140
1 48	120	100
2 10 30	108	98
	Thebain, .005 gramme.	
2 11 15	107	74–108
2 11 45	35	72
2 12 15	50	92
2 12 45	85	122
2 13 15	91	122
2 40 45	83	84

Experiment II. — Rabbit, curarized.

Time.	Pulse.	Pressure.
	147	90
	Thebain, .0025 gramme.	
A. M. 9 1	146	86–106
9 1 30	139	104
9 2	150	100
9 3 30	143	112
9 5	148	112
9 7 30	139	114
9 12 30	125	106
9 18	121	94
9 24 30	127	118
10 19 30	99	94
	Thebain, .005 gramme.	
10 19 45	97	90–118
10 20 15	35	148
10 21 15	64	162
10 21 45	77	162

Experiment III. — Rabbit, curarized.

Time.	Pulse.	Pressure.
	98	78
	Thebain, .0025 gramme.	
P. M. 12 30 30	104	78
12 31	135	105
12 31 30	154	126
12 32	111	110
12 32 30	104	112
12 33 30	115	129
12 34 30	83	89
12 38 15	104	96
12 41	94	80
	Thebain, .0025 gramme.	
12 41 45	113	105
12 42 15	118	138
12 43 45	99	132
12 52 45	96	72
12 53	Thebain, .0025 gramme.	Rabbit dead.

It will be seen by the above experiments that thebain increases the blood-pressure and pulse, there being in some cases a temporary fall of pressure for a few seconds, immediately after the injection, probably due to contact of a foreign substance. If, now, the heart and vascular system with nerves intact give such a result, the next question will be what nervous apparatus is involved in their production. Recent researches in physiology have demonstrated that the circulation is influenced by at least four different nervous apparatuses.

1. Ganglia imbedded in the heart, which cause the rhythmical contractions of the heart, called excito-motor ganglia.
2. Nerves in the cardiac branch of the pneumogastrics which arise from a reflex centre in the medulla and end in the cardio-inhibitory ganglia situated in the heart; their action is to slow the heart.
3. The accelerator nerves, or excito-cardio-motor apparatus, which increase the heart-beat. These nerves are not in constant action.
4. The vaso-motor centre (recently located by Owsjannikow and Dittmar) whose nerves, running to the muscular fibres situated in the vascular walls, regulate the calibre of the vessels, and thus increase or diminish the pressure.

Now the frequency of the pulse can be increased by increase of temperature through direct action of thebain on the excito-motor ganglia located in the heart, through irritation of the accelerator nerves, and through paralysis of the pneumogastrics. The increase of the pulse by the increased pressure is still *sub judice*. The temperature during the experiments was falling instead of rising, which excludes the first of the above-mentioned possibilities.

ACTION OF THEBAIN ON CARDIO-INHIBITORY APPARATUS.

There are several methods of studying this action. One is to poison the animal, and to sever the pneumogastrics when it is completely under the influence of the poison; or to sever the vagi first, then poison, and compare the effects with those obtained with the vagi intact; or to find out the irritability of the nerve by Dubois's coil, then to poison, and test irritability at different periods, or to paralyze the vagi by atropin or nicotin. I have made use of some of the above methods.

Experiment IV. — Rabbit; vagi cut; artificial respiration; curare.

Time.	Pulse.	Pressure.
	130	154
	Thebain, .0025 gramme.	
A. M. 11 30	135	160
11 30 30	137	176
11 32 30	137	160
11 40	• 99	138
12 9 45	112	88

Experiment V. — Rabbit; vagi cut; depressor nerve prepared; curare.

Time.	Pulse.	Pressure.
	166	85
	Thebain, .0025 gramme.	
P. M. 1 20	156	76
1 20 30	205	87
	Vagus irritated.	
1 23	158	64
1 26 30	190	70
1 29	Depressor irritated.	
1 29 30	198	40
1 30	Vagus still inhibits.	

Experiment VI. — Rabbit; curare; nicotin; vagi do not respond to moderate currents.

Time.	Pulse.	Pressure.
	148	102
	Thebain, .0025 gramme.	
P. M. 2 40 30	161	108
2 41	161	122
2 41 30	159	116
2 42	155	108
2 49	133	90
3 1	134	90

Experiment VII. — Rabbit; curare; atropin; vagi paralyzed, as tested by strong currents.

Time.	Pulse.	Pressure.
	175	160
	Thebain, .005 gramme.	
P. M. 1 40	186	172
1 40 30	162	176
1 41	153	178
1 54	152	158

It is evident from the above results, when compared with those where the pneumogastrics are intact, that thebain has no action on the cardio-inhibitory ganglia.

ACTION OF THEBAIN ON THE HEART.

To study the action on the heart, I divided the spinal cord between the atlas and the occiput, thus removing the influence of the vaso-motor centre and the accelerator nerves. In addition, the sympathetic, pneumogastric, and depressor nerves were divided. Then the blood-pressure, which depends on the strength and frequency of the heart-beat on the one hand, and on the other on the tonus of the vascular system, was observed.

Experiment VIII. — Rabbit; curare; cardiac nerves in the neck cut; cord cut between the atlas and the occiput (verified by post-mortem examination); bleeding checked by bovista.

Time.	Pulse.	Pressure.
	168	36
	Thebain, .0025 gramme.	
A. M. 11 40	166	36
11 41	174	31
11 41 30	178	34
11 59	108	30

Experiment IX. — Rabbit; curare; cord cut between the atlas and the occiput; hæmorrhage controlled by bovista; all cardiac nerves in the neck cut.

Time.	Pulse.	Pressure.
	133	32
	Thebain, .0025 gramme.	
	137	34
	122	32
	150	30
	140	32
	98	22

The above experiments show that thebain still increases the pulse, but not the pressure. As the main factor in the regulation of the pressure, that is the vaso-motor centre, has been removed in the above experiments, it is to be concluded that thebain has an excitant action on that centre. The increase of pulse must be due to an excitant action on the heart itself, that is, on the excito-motor ganglia, since thebain, as shown above, has no influence on the curve of a striated muscle, and probably, therefore, has little or none on the muscles of the heart.

In this connection it is interesting to notice a difference between the effects of thebain and of strychnia, poisons which in other respects resemble each other closely. Schlesinger[1] has shown that strychnia causes a decided rise of blood-pressure, even after section of the cervical cord, and concludes from this and other experiments that there are vaso-motor centres in the spinal cord. Thebain, unlike strychnia, seems to have no power to cause the blood-pressure to rise.

ACTION OF THEBAIN ON THE VASO-MOTOR CENTRE.

It is well known that the irritation of a sensory nerve causes an excitation of the vaso-motor centre, which is indexed by a rise of pressure. To still further confirm the preceding view that the centre is active, the following experiment was made. Ludwig's gimlet electrodes were screwed into the atlas and the occipital bone for direct irritation.

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[1] Wiener medicinische Jahrbücher, 1874, i. 1.

Experiment X. — Rabbit; vagi cut; curare; sciatic nerve prepared.

Time.	Pulse.	Pressure.
	144	150
	Thebain, .005 gramme.	
A. M. 10 40	137	186
10 40 30	143	198
10 41	149	194
10 57 45	130	152[1]
10 58 15	136	174[2]
11 1 55	137	188
11 4 15	142	114
	Thebain .005 injected.	
11 4 45	129	124[3]
11 5 15	130	168

Certainly the vaso-motor centre is in no way paralyzed after the injection of thebain. As indirect irritation always produces a rise of pressure, the sensory nerves and the conductors of their impressions up the cord are not paralyzed. Experiment V. shows that the reflex relation existing between the vaso-motor centre and the depressor nerve is in no way affected.

The following *résumé* will express our results: —

1. Thebain is a tetanoid agent, and pigeons have no special immunity against it.
2. The tetanus is not cerebral, but spinal, in origin.
3. The motor and sensory nerves and the striated muscles are not affected by it.
4. It increases the pulse and blood-pressure by an action on the vaso-motor centre and the heart itself.
5. The reflex action of the depressor nerve is in no way interfered with.

The above experiments were made in the physiological laboratory of Prof. H. P. Bowditch, at the Harvard Medical School. I wish here to express my many obligations to him in their pursuit.

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RECENT PROGRESS IN THE TREATMENT OF THROAT DISEASES.[1]

BY F. I. KNIGHT, M. D

Anomalous Action of the Epiglottis. — In a case of paralysis of the left recurrent nerve from pleuritic effusion (in a case of phthisis), the following anomaly in the movement of the epiglottis was seen. It (the epiglottis) stood farther back on the left than on the right side. On phonation, it made a remarkable movement towards the right, so strong that it stood directly over the right sinus pyriformis. Schrötter says if this were simply a lower position of one side of the epiglottis, it could be explained by a paralysis of one aryepiglottic muscle; but that the energetic movement mentioned above must be due to a paralysis of those fibres of the genio-glossus muscle which extend from the tongue to the anterior surface of the epiglottis. The same must be true also of those fibres of the stylo-pharyngeus of the left side which, through the pharyngo-epiglottic ligament, run to the epiglottis. In this connection it is to be considered that the genio-glossus muscle is innervated from the hypoglossal, and the stylo-pharyngeal from the glosso-pharyngeal nerve. So we must conclude that besides the inferior laryngeal, some fibres of these last-named nerves must have been paralyzed also; only *some* fibres, however, as both the movement of the tongue and deglutition were unaffected. A little later another peculiarity appeared in this patient. When the epiglottis after phonation had returned to a state of rest, there followed a spasmodic movement of the same towards the left; so it appeared that the paralysis of the nerve-fibres on this side, as mentioned above, was not complete.

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[1] Vaso-motor centre irritated directly.

[2] Vaso-motor centre irritated indirectly, through a sensory nerve, for three seconds.

[3] Vaso-motor centre directly irritated for eleven seconds.

[4] Concluded from page 384.

Another case of similar anomalous movement of the epiglottis is given. This was in a patient with chronic naso-laryngo-tracheal catarrh. During quiet respiration the epiglottis stood in normal position. As soon, however, as a vocal sound was made, the left side of the epiglottis sank backwards, and the right raised itself up, so that the view of the left vallecula became better, and that of the right was diminished. The more loudly the patient spoke, and especially when he pronounced *i* (English *e*), the more marked did this movement become, which in fact consisted of a twisting of the epiglottis on its long axis.

Chorea Laryngis. — Schrötter gives a case of this rare affection of the larynx, of which he has seen eight cases in all. The affection consists in a spasmodic, resonant expiration, which often shows a certain rhythm, over which the patient has little or no control. The patient whose case is here given in detail was a girl, eleven years old, who had had the trouble six months. The attacks occurred every few minutes, but sometimes ceased for a quarter of an hour, and they always ceased entirely during sleep. Laryngoscopic examination showed only quite an inconsiderable catarrh of the larynx and trachea. The cause was considered to be excessive hyperæsthesia. The patients were all young and anæmic; hence iron as well as quinine and cold baths were employed. All the cases were cured in a few weeks, electricity being used in addition in two cases.

Recurrence of Tracheal Tumor. — There has been a recurrence of the growth in the well-known case which Schrötter treated by injection of sesquichloride of iron; the patient has put off a repetition of the operation till he has more trouble from it.

Dilatation of Stricture of the Bronchi. — A man appeared at Schrötter's clinic with stridulous breathing. The larynx and whole length of the trachea were seen to be free from obstruction. The respiratory murmur was found on auscultation to be weak, and weaker on the left side, behind, than on the right; and there were heard also, here and there, some fine, moist râles. But nothing was found sufficient to account for the severe dyspnœa, and as no sign of heart disease was discerned, Schrötter concluded that there was stricture of the primary bronchi. The patient had had syphilis, but had undergone all kinds of treatment without benefit. Schrötter decided to undertake the dilatation of the suspected strictures by means of bougies. For this purpose he had the instrument which he had used before for dilating the trachea (one capable of being lengthened out after being introduced into the larynx) modified so that it could be introduced into the right or left primary bronchus at will. A little curved piece, which was also capable of being turned in any direction, was added to the end of the outer tube. After reaching the bifurcation the inner rod could be forced into the right or left primary bronchus, according as the concavity of this little piece was directed to the right or left. On the end of the inner rod bulbs of different sizes could be fastened. After three weeks' training, on November 21, 1872, Schrötter tried this instrument with a bulb one sixth of an inch thick, and had no doubt but that it entered the right primary bronchus. The next day he passed it into the left, but with more difficulty. This was repeated daily, without pain. At the end of a week the patient voluntarily stated that he breathed more easily.

December 3d, a thicker extremity was used. After the introduction, tough, hard clumps of mucus were coughed up.

December 5th, the patient reported himself as feeling better, and had been able that morning to take a long walk, which had been quite impossible before. The respiratory murmur seemed somewhat louder.

December 9th, signs of pleurisy appeared, which resulted in effusion. He went home to be with friends, and two months afterwards Schrötter heard of his death. The pleurisy could not be attributed to treatment. There was no autopsy.

Bronchocele. — There were one hundred and eighteen cases of this affection. Only three were cystic. The nationality of the patients was so various as not to be worth the trouble to publish. In twenty-six there was stenosis of the trachea; in two, paralysis of a vocal cord. Schrötter pursues the treatment mentioned in his earlier report. Iodglycerin inunction usually led to a successful result. In only a few cases was iodide of potassium used internally at the same time. The injection of tincture of iodine was tried in nine cases where the iod-glycerin externally did not act rapidly enough, but with little success, except in two cases, in which the compression of the trachea was almost entirely relieved.

Bronchotomy. — The windpipe was opened in twenty-six cases; laryngotomy was performed in sixteen cases (twice by cutting only the crico-thyroid ligament, fourteen times the cricoid cartilage also); tracheotomy in five cases (above the thyroid gland four times, below the thyroid gland once); laryngo-tracheotomy in five cases. Schrötter says that where there was reason to suspect that the disease extended low down in the larynx, he usually did tracheotomy, and would always do so in such cases in the future, in order that the irritation might be as far as possible from the disease, those cases being excepted in which a purulent collection in the larynx was suspected. The diseases which led to the operation of opening the windpipe were as follows: in fourteen cases perichondritis (eight syphilitic, four tubercular, two typhoid); in five, carcinoma of the larynx and trachea; in two, carcinoma of the thyroid gland; in one, croup; in one, diphtheria; in one, aneurism; in one, foreign body; and in one, cicatrices in the larynx. *Local anæsthesia only* was employed in all these cases, and Schrötter says he cannot recommend this procedure too strongly. In case the operation was not considerably protracted by unusual accidents, it was entirely painless. Local anæsthesia had no ill-effect on the healing. In one case there was a separation of the mucous membrane from the trachea, so that the canula did not enter it, but only the artificially formed blind sack.

In the attempts to dilate strictures of the larynx, it was found that the fenestra in the upper wall of the outer canula was situated three or four lines too far back in all the cases, so that it did not correspond to the glottis. This circumstance should be remembered with reference to easy phonation.

Chronic Nasal Catarrh. — For cauterizing the swollen mucous membranes and ulcerations, Schrötter uses anteriorly the following instrument: A silver staff about seven inches long and an eighth to a twelfth of an inch thick is provided with a groove at its anterior part, in which nitrate of silver can be fused to any extent; this fits into another silver tube which has a slit on one side. The instrument is so introduced into the nostril that the nitrate of silver is covered by the outer tube. The staff is now turned by its handle, and the nitrate of silver comes round to the slit in the outer tube, and into contact with the affected part. If one will take the trouble to measure the distance of the diseased surfaces, cauterization of very limited areas can be effected with much nicety. This instrument, with one for cauterizing the posterior nares, described in a previous report, makes it possible to cauterize all parts of the nose. Schrötter never uses uvula-snares or palate-hooks, either in examination or in operation.

Nasal Polypi. — Schrötter cauterizes after operation, and insists on rhinoscopic examinations as the only means of knowing if the operation has been thorough; he says in regard to the common idea of frequent recurrence, that the large polypi are removed, and the small ones, left behind, have a chance to grow, and recurrence is then said to have taken place.

Chronic Pharyngitis. — Schrötter approves of the destruction of enlarged follicles either by galvano-caustic or by caustic potash.

Malformation. — An unique case. A woman, thirty-seven years old, who presented herself with disease of the heart and catarrh of the larynx, was accidentally examined with the rhinoscope, and it was noticed that the nasal septum was split at about its upper third at a tolerably acute angle, and so formed the opening into a cavity covered with smooth, dry mucous membrane, which extended to the base of the skull; the opening was so large that the end of the index finger could easily go into it. The patient had experienced a severe fall, when fourteen years of age, and was for a long time unconscious; so it might have been thought that this anomaly was due to injury. But Schrötter considered it to be a malformation at once, on account of its symmetry and the depth of the cavity. This opinion was confirmed by some observations on young fœtuses by Dr. Langer, who will communicate the results of his investigations in full.

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THE SOURCES OF AN ADDITIONAL WATER-SUPPLY FOR BOSTON.[1]

Last summer, while the city council of Boston was discussing the question of an additional water-supply, an order was passed requesting the mayor to appoint three physicians to examine and report at an early opportunity upon the comparative desirability, on sanitary grounds, of the Sudbury, Mystic, Shawshine, and Charles rivers. The mayor accordingly appointed Drs. Charles W. Swan, Edward S. Wood, and H. P. Bowditch as members of the medical commission. Their report, which makes a pamphlet of something more than one hundred pages, was made and submitted to the city council near the end of the year 1874. The results of their investigations were very favorably reviewed in the subsequent debates upon the subject in the common council, and it is but just to say that they threw much light upon a question of great perplexity, and had an important influence upon the settlement of the matter.

The commission has done an excellent service, not only to the city of Boston, but to a much wider circle of cities and towns, in awakening the community to the vital importance of obtaining pure water for drinking purposes, and to the only conditions under which pure water can be secured.

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[1] *Report of the Medical Commission upon the Sanitary Qualities of the Sudbury, Mystic, Shawshine, and Charles River Waters.* 1874.

It will be a source of regret to those who examine the report with reference to the immediate question which induced the creation of the commission, that the brief period of time (something like five months) which the circumstances of the case would allow for its investigations was much too short to enable it to arrive at an altogether satisfactory decision upon some of the points under consideration. Entirely conclusive results as to the comparative desirability of the different rivers, so far as the color, taste, and general appearance of the water are concerned, could, it would be supposed, only be obtained by examination of the water of each river at the different seasons of the year, and under the various conditions to which the waters of the different rivers are subjected. But in truth the time at the command of the members of the commission only enabled them to make their investigations on this point in September and November. Now it has been asserted to be a fact of common observation that the Sudbury at this season is exceptionally colored, a claim which might seem to be confirmed by Professor Nichols in his report concerning the condition of various rivers, appended to the Report of the State Board of Health of 1873, in which he says, "The Sudbury River flows through meadow-lands, acquiring thereby in the late summer and fall a yellow, almost brown color." Under these circumstances, whatever the average result from extended investigations, it might naturally be expected that the Sudbury would, from the examination of the commission, take an inferior place in the order of preference in this respect.

Again, in the more important matter of making analyses in order to determine the chemical composition of the different river waters, the commission was unable to collect for examination more than *one* specimen from each of the points on the different rivers selected for the purpose. They did, indeed, avail themselves of the results of the analyses made by Professor Nichols in 1872, but the importance of obtaining results under as many as possible of the changing conditions of the rivers is again apparent.

We should hope also that a longer period for investigation would have led the commission into a consideration of the effect upon the water of the different rivers resulting from the "nature of the soil and configuration of the land" of the respective drainage areas, a subject which is at the outset declared dismissed with the remark that "the four drainage areas under consideration are so far alike that no difference in the river water due to these causes is likely to persist after storage has been effected in the basins provided in all the proposed schemes." But taking into view the injurious effect upon rivers shown by the report to result from indirect drainage or flow of the sewage matter through the soil into the rivers, and the attention bestowed upon the comparative density of the population of the different areas, it would seem that the disposal of the bulk of the population, whether upon close and hard soil or upon loose and gravelly soil, and whether upon a greater or a less slope toward the river-bed, would be an important element for consideration, and that it should hardly be concluded that these conditions are so far the same in the different drainage areas without a very careful and extended investigation. We think, however, that notwithstanding the above remark, this subject does subsequently receive some attention under other heads of inquiry.

The commission has treated the whole subject under the following divisions: 1st. Nature of the soil and configuration of the lands; 2d. Color, taste, and general appearance of the water; 3d. Sources of pollution, including vegetable substances, sewage, drainage from cemeteries, and manufacturing refuse; 4th. Density of the population and its probable increase in the different areas; 5th. Chemical composition of the waters; 6th. Opportunities for storage.

Part I. is devoted to a general consideration of these questions, and is to a great extent given to the investigations of eminent medical and scientific authorities into the pollution of water by sewage and other decomposing matter, and the difficulty often experienced in detecting contamination by chemical analysis. Much information of a permanent character is here gathered, though there seems to be occasional confusion of statement and some substantial repetition. As a single instance of the former, from page 18 we should be led to suppose that scarlet fever may be a disease affected by water; on page 46 the contrary is assumed.

Part II., containing a description of the rivers in question, and Part III., which is a comparison and summing up of the results arrived at, testify to hard work by the members of the commission. A large amount of valuable information under each of the divisions of the inquiry is collected and is plainly and concisely set forth.

The commission finds that the natural waters of all the rivers may by proper storage be rendered sufficiently pure for domestic uses, apparently, in fact, as pure as the water which has been received from Lake Cochituate; and that so far as the Shawshine, Charles, and Sudbury are concerned. all considerable sources of pollution may by possible measures be removed, and proper storage basins be built. The announcement of these results tended to allay a great deal of uneasiness which had arisen. At the same time the commission has not failed to enforce the vital necessity of removing all existing sources of impurity upon the river to be selected, and of preventing all other sources of pollution arising.

In seeking to arrive at the comparative desirability of the rivers as sources of water-supply, the commission has prominently arranged under each head of inquiry the order of preference, and finally by a single table declared its absolute preference in the following order: —

I. Shawshine.
II. Charles.
III. Sudbury.
IV. Mystic.

This mode of stating the conclusions in a report to readers many of whom will hardly scan with care the statements in connection with their proper qualifications, but will only seize the prominent conclusion, is perhaps open to some objection. An inferior position in the tabulated order as to color is of but little consequence; in the table as to opportunities for storage, it is of great importance. Yet to the superficial reader, who rushes to the "conclusions," the tables count as of equal importance. The final order, too, does not indicate to the hasty reader that there is a considerable difference in the above order between the first and second rivers, but little between the second and third, and a long interval between the third and fourth, as the commission is careful to explain.

When, in departing from the matters in which the members of the commission from their professional knowledge have peculiar means of judgment, they enter the field of speculation upon the probable increase of population and manufactures in the drainage areas, subjects upon which they lay much stress, and upon the decision of which they to a great extent base their conclusions, they perhaps lay themselves open to criticism by others as well qualified to judge as themselves. It is, of course, easy to reach opposite conclusions by combinations of statistics, and perhaps nothing is truer than the contrary of the old adage that "figures won't lie." It is hardly safe to found important conclusions upon the supposition that the future comparative growth in population of two Massachusetts country districts will be the same in the future as it has been in the past. As densely populated as these districts now are, it is perhaps quite as safe to infer that that region which has grown the fastest in the last score of years will increase the most slowly in the next decade or two. But the growth of such districts now depends, it is well known, upon circumstances temporary and peculiar to each district.

As to the future danger of pollution by manufacturing refuse, the commission makes the Charles preferable to the Sudbury, because, while the drainage area of the Charles shows a percentage of increase in the value of manufactured products from 1845 to 1865 of 310 per cent., that of the Sudbury shows in that interval an increase of 823 per cent. But a comparison of the tables will show that the value of those classes of manufactured products which are the particular sources of pollution (first, second, and third) at the last date at which we have statistics were in the ratio of 1442 in the Sudbury basin to 5202 in the Charles basin; that as a fact the value of those products in the Sudbury, though increasing at the ratio of 597 to 1442 for the whole period from 1845 to 1865, reached the culminating point in 1855, and from 1855 to 1865 *decreased* in the ratio of 3772 to 1442, and that in the basin of the Charles there was, from 1855 to 1865, an increase in the ratio of 3810 to 5202; that, indeed, the entire value of such products in the Sudbury area in 1865 was but $105,300, or less than one seventh of the value of the corresponding products in the basin of the Charles in that year; and that the manufactures in the Sudbury area were chiefly (fourth class) the products of boot and shoe factories (without water power, and not directly upon the river), of straw works, and of saw and grist mills, the refuse of which is comparatively inoffensive. In this class alone was there present an increase of products. Yet because the value of the products of all kinds have increased in a greater ratio from 1845 to 1865 on the Sudbury than on the Charles, the commission concluded that the risk of pollution from manufacturing refuse in future is greater in the Sudbury than in the Charles.

The result of the report was awaited with especial interest as a comparison between the Charles and Sudbury rivers. The commission gives to the Sudbury the preference in chemical purity, opportunities for storage, and present risk of contamination by manufacturing refuse; to the Charles the preference in color, taste, general appearance, and risk of contamination by present and future population, and by future manufacturing refuse, and say that the probability is, therefore, that chemical analysis will turn ultimately in favor of the Charles, leaving to the Sudbury of the future the sole advantage of superior storage facilities. Taking into consideration what has been said, and the further fact that the commission suggests modes by which the direct sewage of the Sudbury towns can be diverted, but says that in the case of some of the Charles River towns the question of diversion of sewage is not easily answered, it may possibly happen that the city council in taking the waters of the Sudbury rather than looking to the Charles acted wisely, even in a sanitary point of view.

We should not omit to make favorable mention of the diagrams which are given in connection with the various tables, and which afford a ready interpretation of the figures. An ingenious process is also described, by which the commission was enabled to estimate and compare the color of the various waters with much greater accuracy than can be secured by the naked eye.

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REMARKABLE ELEVATION OF TEMPERATURE.

The medical world in London has been not a little startled by a communication lately made before the Clinical Society by Mr. Teale, of Scarborough. The facts of the case in question emanate from an authority so reliable, and are based on such careful observations, as to leave little or no room for doubt as to their correctness, while in order to accept them we are forced to abandon in a mist of uncertainty and obscurity many facts in physiology and pathology which have hitherto been considered as well established.

Indeed, the "American case" and its crowbar may be said fairly to pale before the formidable array of data here presented, and for a time at least the palm will have to be transferred to its English sister.

The account of the case given by the *Lancet*[1] is in brief as follows: A young lady was thrown from her horse in the hunting-field early in September last, and sustained a fracture of two of her ribs and some obscure injury to the spine over the sixth dorsal vertebra. The fractured ribs soon united, but shortly afterwards symptoms of inflammation in and about the spinal membranes were developed, and the temperature began to rise and in a few days had reached 106°. A few days later, November 8th, it was 110°; on the 13th it had risen steadily from that point to 122°, and how much higher is not exactly known, as the index of the thermometer was buried in the bulb at the top of the instrument. During this period the pulse kept at about 120; the patient rapidly emaciated and often appeared to be sinking. Ice-bags to the spine, and mercurial inunctions, were the treatment resorted to. On four different occasions the temperature went above 120°, and during the greater part of November and whole of December remained above 110°. By January 10th the temperature had become normal, and a fortnight later the patient was rapidly convalescing and took out-of-door exercise. Mr. Teale said that no fewer than seven different thermometers had been used, and one which registered 122° was specially provided. The temperature was ordinarily taken in the axilla, but was also taken in the rectum and between the thighs. The records of the case show that the observations were made in the most careful manner, and that there was no possibility of error arising from the use of hot-water bottles or from deception. The urine was passed with difficulty in hot towels and appeared almost a mass of lithates. The menses, which appeared once after the accident, were suppressed until January 20th. When the thermometrical readings were highest, the hands, feet, and forehead were icy cold, and the patient remarked that she felt as if her blood was on fire. If the figures above recorded are to be regarded as representing accurately the internal temperature of the body, our ideas of the thermal limits within which the various organs and tissues can perform their functions must be considerably modified. Though these limits have not been so accurately determined for warm-blooded as for cold-blooded animals, yet it is generally admitted that vital functions cease to be performed at temperatures below those which were reached in this case. Thus Rosenthal found that rabbits exposed to artificial heat died soon after the temperature in the rectum had reached 44° or 45° C. (111.2° or 113° F.). It is stated also on the authority of Kühne that blood loses its power of coagulation at 50° C. (122° F.), since at this temperature both the fibrinogenous and the fibrinoplastic substances lose their specific energy. The temperature at which muscular rigidity is produced by the coagulation of certain albuminoid constituents of muscle-serum seems to be for warm-blooded animals not higher than 49° C. (120.2° F.).

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[1] The Lancet, March 6, 1875.

Either we must assume, therefore, that the thermal limits of vitality of the tissues are liable to considerable variations, according to certain unknown conditions, or we must regard the thermometric records in the above case as representing local and not general temperatures. In favor of this latter view is the above-mentioned icy coldness of the hands, feet, and forehead. On the other hand, unless we adopt the very improbable hypothesis that there was a local production of heat in the skin of the axilla, it is difficult to understand how a thermometer in that region could record 122° F. unless the temperature of the blood had reached at least as high a point.

Whatever may be the true explanation of this extraordinary case, it will undoubtedly lead to the renewed investigation of the conditions which may affect the resistance of animal tissues to high temperatures.

A RARE CAUSE OF UNCONTROLLABLE VOMITING.

A REMARKABLE case of a stomach twisted upon itself and causing uncontrollable vomiting is reported by Dr. L. Mazzotti, and appears in *L' Union Médicale* of January 19, 1875. A woman fifty years of age entered the hospital at Boulogne, in February last, for a caseous pneumonia of the right lung, with cavities. She had been sick for five years, and for a year past menstruation had been absent. But the most remarkable symptom in her case was uncontrollable vomiting, which had persisted for five months. A sensation of excessive pain and oppression was always present in the epigastrium as soon as she had eaten, while it was absent when she fasted. Upon the ingestion of food, especially that which was solid, the pains were such that the patient would roll upon her bed and cry out until she was relieved by vomiting. This occurred every time that food was taken, and alimentation was limited to a few grammes of milk daily.

The autopsy in establishing the diagnosis showed that the stomach occupied nearly the whole of the sub-umbilical region. The organ was clearly divided into two parts; the upper portion was the left and vertical, the lower the right and horizontal, with a contraction in the middle. The walls of the stomach were turned upon their longitudinal axes by the rotation of the inferior or pyloric upon the cardiac portion, making almost an entire circle, the contracted point being the centre around which the rotation was made. The pylorus was low down and movable, and the epiploön was stretched. The vertical part of the stomach, above the point where the twist was made, was distended with gas, while the inferior part was scarcely visible and its walls were in contact. Some adhesions in the pyloric region united it to the abdominal walls. These were easily broken, and the twist being unwound the organ appeared like an hour-glass-shaped stomach with a central contraction. Removed and inflated, the stomach presented its natural form and showed no traces of the contraction. There was only a slight catarrh of the mucous membrane at the contracted point; all the rest of the organ was normal. The intestines, compressed to a very small volume, were scarcely visible.

This case and another of a similar nature reported by Dr. Iago, under the title of the Hour-Glass Stomach,[1] show the pathological and clinical importance of this form of contraction of the stomach, which authorities mention from an anatomical point of view only. The most recent works on clinical medicine do not allude to it. Whether it is congenital, as Morgagni held, or results from excessive contraction of the transverse muscular fibres, as is generally admitted on the authority of M. Sappey, its pathology ought always to be kept in mind, especially as causing uncontrollable vomiting.

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MEDICAL NOTES.

— Dr. Wm. H. Mixon, of Hope, Ark., reports to the *American Practitioner* the case of a man sixty-eight years of age who suffered from retention of urine. After twenty hours' delay, in which attempts to relieve the distended bladder by the use of the catheter, hot baths, belladonna, and chloroform were unavailing, it was decided to puncture the bladder. No proper canula and trocar for puncture by the rectum being at hand, even had not the enlarged condition of the prostate seemed to preclude this operation, and having only an ordinary catheter and bistoury, Dr. Mixon opened the bladder above the pubes, and inserted a No. 8 female catheter. In five days small quantities of water began to pass by the urethra, but attempts to pass a catheter through it were not successful. Eleven days after the operation the urine resumed its natural course, and four days later the instrument was withdrawn from the hypogastric opening, where it had remained without exciting any irritation. The wound healed readily, and the patient's health at the time of writing the report of his case was perfect.

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[1] L'Union Médicale, 1873.

— J. S. Lombard, M. D., formerly Assistant Professor of Physiology in Harvard University, has recently invented a portable thermo-electric apparatus for medical and physiological investigations. The instrument consists of five parts: the galvanometer, the rheostat, two thermo-piles, a tin kerosene lamp, and a brass stand with a horizontal arm having a clamp at its end. The two thermo-piles consist each of eight pairs of bismuth and an alloy composed of antimony and zinc. This alloy is the result of elaborate researches made some years since by Mr. Moses G. Farmer, of this city. A full description of the instrument, together with illustrations, may be found in the *British Medical Journal*, January 23, 1875.

— At a meeting of La Société de Biologie, reported in the *Mouvement Médical*, M. Liouville presented in his own name and in that of M. Strauss a case of compression of the medulla spinalis, observed in a man fifty-two years of age. The patient was seized at L'Hôtel Dieu, in September, 1874, with paralysis of the lower extremities. The occurrence of the paralysis was very sudden, and a guarded diagnosis was made of hæmorrhage into the spinal marrow and its membranes. The disease pursued the course of a hæmorrhage into the spinal cord. Emaciation rapidly followed, and then death. The diagnosis was erroneous, and there was found to be a compression arising from hydatids of the vertebral canal. The compression, which was situated at the level of the eleventh and twelfth dorsal vertebræ, resulted from a hydatid tumor and a yellow caseous mass. There was a considerable anæmia of the lumbar region and of the cauda equina. At the lower part of the left lung, between the lung and the diaphragm, there was a large tumor filled with hydatids, which had occasioned a degeneration of the bones and ligaments of the spine. This degeneration was principally at the posterior part. The hydatids had suddenly and all at once broken through the cyst, a circumstance which explained the rapid appearance of the symptoms mentioned above.

— Those of our readers who have followed the ether and chloroform discussion in the English journals have doubtless watched with interest the gradual change of opinion which has taken place in that country, during the last few years, in favor of ether as an anæsthetic. In this connection an account of a visit of our fellow-townsman, Dr. Fifield, to the Royal Infirmary at Liverpool will doubtless be of interest. Dr. Fifield, at the request of the surgical staff, demonstrated the American method of giving ether in three different cases. A correspondent of the *British Medical Journal* says, —

"In each case Dr. Fifield gave ether, using no other apparatus than a conical hollow sponge. Complete anæsthesia was produced in each case in from three to four minutes. Addressing the students and those assembled in the theatre, Dr. Fifield said that, although an American by birth, he had been educated in England and in Paris; had no prejudice either for or against chloroform, and had enjoyed ample opportunities of witnessing the use of both chloroform and ether. The latter he had himself given in thousands of cases; had seen it given in the hospitals of New York, Boston, and other towns in his own country, and had never seen or heard of a fatal result. He was greatly surprised on his arrival here to find that English surgeons still adhered to the use of chloroform, which in America was almost proscribed. The great superiority of ether was its perfect safety. The operator commenced and completed his task without the smallest anxiety as to the effect of the anæsthetic; whereas, when chloroform was used, it was impossible, in spite of every precaution, to predict with certainty that the patient, although in comparatively good health, might not, before or after the operation was finished, be found a lifeless corpse. As to the mode of administration, no expensive or complicated apparatus was necessary; nothing, in his opinion, was more suitable than a hollow conical sponge. The ether should be given at once freely; a lavish use of it at first proved a saving of material in the long run. Etherization presents three definitely marked stages: first, that of muscular relaxation; second, tetanic convulsive action; third, complete surgical anæsthesia, indicated by stertor, or what he called the "snoring stage;" and, unless this stage were fully reached, there was risk of partial failure, so far as full insensibility to pain was concerned. We think it probable that the clear and forcible way in which Dr. Fifield has put the matter before the profession here will lead at least to a renewed trial of ether as a substitute for chloroform."

— Professor Lister lately operated successfully at the Edinburgh Royal Infirmary, in a case of goitre affecting both sides of the thyroid body. Before proceeding to remove the tumor, the operator ligatured the superior and inferior thyroid arteries, by which preliminary hæmorrhage was almost entirely prevented.

— We learn from the *Atlanta Medical and Surgical Journal* that the legislature of Georgia has passed a law creating a State Board of Health. The new board is charged with the registration of births, marriages, and deaths, in addition to the general sanitary supervision of the State.

SURGICAL OPERATIONS AT THE BOSTON CITY HOSPITAL.

[SERVICE OF DRS. CHEEVER, THORNDIKE, AND WADSWORTH.]

THE following operations were performed during the week ending Friday, March 26, 1875: —

1. Glandular tumor of neck. 2. Double hare-lip. 3. Hæmorrhoids. 4. Amputation of fingers (three cases). 5. Mammary Abscess. 6. Enucleation of eye. 7. Strabismus. 8. Canthoplasty (two cases). 9. Iridectomy. 10. Chalazion (four cases).

1. *Glandular Tumor of Neck; Excision of Clavicle; Probable Wound of Thoracic Duct.* — A brass-molder, twenty-two years of age, first noticed a swelling in the left side of his neck three months ago. It gradually increased, and was accompanied by severe pain in the left shoulder and impaired use of the muscles of the left hand. He entered the hospital on the 15th inst.

There was a firm, lobulated, slightly movable tumor on the left side of the neck. It dipped down behind the clavicle a little, and extended about four inches upwards, and inwards nearly or quite to the median line. There was one enlarged gland in the axilla. No increase in size of the spleen. The white blood corpuscles were increased. The patient had lately lost flesh and strength, and was pale and sallow. His previous health and his family history were good. The tumor was of large size, being four inches in diameter, of rapid growth, and with acute symptoms. The diagnosis was probable leucocythæmia. It was decided to attempt its removal to relieve pain, and also to free the system from a large mass of exaggerated gland tissue, constantly increasing the surplus of white blood corpuscles.

Dr. Cheever made an incision along the posterior border of the sterno-mastoid muscle, and this, with the external jugular vein, was drawn forwards. A cross cut was then made from the middle of the incision, about three inches, to the trapezius. The flaps of skin were reflected, and the tumor exposed. It was found to be entirely solid, lobulated, and pretty firmly fixed. It extended forwards under the sterno-mastoid into the carotid triangles. To reach this portion the clavicular head of the sterno-mastoid was cut away. The edges were gradually loosened by cutting fascia and tearing adhesions, until the upper three fourths of the growth were lifted up and detached, and thus far without large hæmorrhage. The omo-hyoid muscle was now divided, and the dissection pursued in the subclavian triangle. Here a copious venous bleeding occurred from below the clavicle, and in attempting to turn the tumor outwards by dividing a bridle on the inner side, this too proved to contain a large venous trunk, and bled freely. To reach the bleeding points speedily, the tumor was now cut across, two thirds of it removed, and the remainder, about an inch and a half in diameter, left at the bottom of the subclavian triangle. It became evident that the subclavian vein, and a large vessel near the internal jugular, were both wounded. The distended veins, mixed up with a friable glandular growth, gave way repeatedly under the forceps and ligature. At this time occurred a new source of difficulty. A transparent, viscid, coagulable, and colorless fluid ran out from the cut tumor, and from the lower corner of the wound, in quantities as large as an ounce at a time, some six separate times. Together with the dark venous blood, this fluid constantly obscured and filled the bottom of the neck, whenever pressure by the finger or sponges was taken off. After twice passing an aneurism-needle under the subclavian vein and fastening the ligature, and also picking up and tying the punctured sides of the venous trunks, without permanently arresting the bleeding, Dr. Cheever cut down upon and cleared the clavicle, sawed it at the junction of the outer and middle thirds, and disarticulated it at the sternum. Two thirds of the clavicle being removed, free access was had to the seat of hæmorrhage. The subclavian artery was sought and pushed aside, and an aneurism-needle passed between it and the vein, first, out towards the shoulder and a ligature tied, and second, close to the sterno-clavicular articulation, where the needle and ligatures surrounded the venous trunks at or upon their junction in the left vena innominata. The artery was not wounded nor tied. All bleeding now ceased, but the transparent fluid still oozed out, moderately. The wound was lightly packed with sponges and ferric alum. The operation was necessarily a protracted one, and the patient was largely stimulated during the latter stages. He did not vomit, and bore up remarkably well. Removed to bed, he took stimulus and nourishment freely. No hæmorrhage recurred, and the transparent fluid did not soak through the sponges. The patient gradually failed, from shock and exhaustion, and died Sunday morning, thirty-six hours after the operation.

No autopsy was made, but an examination of the wound showed the ligatures to be on the subclavian vein, at the outer part, and also at the junction of the internal jugular and subclavian. The remains of the tumor extended two inches below the clavicle, but were enucleated without piercing the pleura. This fragment of tumor had incorporated into itself several venous trunks, or sinuses, caught and entangled in the gradual agglomeration of glands. There was no opening into the pleura, no sac running down into the thorax or axilla, no cyst in any direction. The source of the transparent effusion could not be traced. There would, however, seem to be but little doubt that this fluid was lymph, from a large branch of the lymphatics in the tumor, or more probably from the thoracic duct, where it arches over to join the left subclavian vein. In contact with, if not surrounded by, the glandular enlargement, its thin and transparent walls were readily wounded in trying to remove the lower part of the tumor. No other source for the clear fluid could be found; there being neither cyst, hydrocele of the neck, nor pleural effusion to account for it. The fluid, under the microscope, exhibited no cells, save a few stray blood corpuscles. The patient, having fasted for twelve hours before the operation, would have but little of the milky emulsion of chyle in the duct. And the fluid answers Dalton's definition of lymph. "It is a colorless, or slightly yellowish transparent fluid; . . . . containing water, saline matters, and a small quantity of fibrin and albumen." "During the intervals of digestion the lacteals [and thoracic duct (?)] contain a colorless and transparent lymph."

The fluid poured out in this wound coagulated after contact with the air, in a firm jelly, just as blood coagulates. This, no doubt, was due to its fibrin. Its large quantity pointed to a considerable duct as its source, though it must be borne in mind that the whole lymphatic system of the neck was vastly increased and enlarged, and secreting great quantities of lymph, probably. It is the vitiation of the blood-current with this excess of lymph, or with white cells, that Virchow adduces as an argument for the removal of glandular leucocythæmic tumors.

Very probably the waste of nutritive plasma by this leakage of lymph in the wound hastened the exhaustion of the patient, and, if due to a wound of the thoracic duct, would have precluded his recovery.

The tumor, after being properly hardened for sections, will be submitted to the microscope. D. W. C.

2. *Double Hare-Lip.* — The patient was four months old. The fissures were complete on both sides; extending through lip, alveolar process, and hard and soft palate. The intermaxillary bones were very prominent. The child was fat and healthy. Dr. Thorndike closed both fissures in the lip. The margins of the skin covering the intermaxillary bones were denuded, and the bones

themselves forced back into place on a line with the alveolar process. Then a strip was cut from each margin of the cleft, and left attached below. The lip having been freely dissected up, the strips were united to each other below the intermaxillary portion, and also to the skin covering that part. Both clefts were in this way closed completely. There was no notch in the upper lip, and there was no strain upon the flaps. Wire and silk sutures were used in closing the wound, and the whole covered with adhesive straps.

5. *Enucleation of Globe.* — The patient, a woman, had had chronic inflammation of the conjunctiva of the left eye for eight years. The conjunctiva was greatly shrunken; the cornea opaque; the upper lid so much incurved that all its lashes were turned directly against the eye. The lashes had been removed from the lower lid a year ago, in Baltimore. The constant rubbing of the lashes on the cornea kept up such an irritability of the other eye as to make it also of little use. The degree of contraction of conjunctiva and lids was such that the result of an operation to relieve the entropion would have been more than doubtful. If the eye alone were removed, no artificial eye could have been worn, and the lashes would still have maintained the inflammation of the conjunctiva.

Dr. Wadsworth said he thought it best, therefore, to remove conjunctiva as well as eye, and thus effect a permanent closure of the lids. The conjunctivæ was dissected away as thoroughly as possible, and the globe enucleated.

GEO. W. GAY, M. D.

LETTER FROM VIENNA.[1]

BEFORE I came to Vienna I thought I had my feet well under me on the question of pulmonary affections, and particularly in regard to catarrhal pneumonia; but I suddenly find my self-complacency is scattered to the winds, and I am all adrift once more. The Vienna school swear that there is no such thing as catarrhal pneumonia. I say the "Vienna school," for I notice that the doctors who make a specialty of children's diseases still retain the term catarrhal pneumonia, and apparently believe in it. Some of the others, however, say that the so-called caseous products of catarrhal pneumonia are really disintegrating tuberculous centres; this is really coming back to the old theory taught by Flint. This theory is advocated by some of the teachers here with considerable warmth, but it lacks, so far as I can judge, the support of an able, recognized authority. They declare that all phthisis is tuberculous, though I believe they disavow any belief in any characteristic cellular structure of the tubercle. They make three divisions of the subject, according to the gross appearances of the lungs, but the tubercle in its various stages of development and degeneration is the corner-stone of the whole. I must say that there is something about the theories of Niemeyer which seems too practical and too plausible to allow of its being supplanted by any such ideas as the above. Of course I do not do full justice in this letter to the Vienna theory, but I think I have faithfully given the drift of it.

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[1] Extract from a private letter, not intended for publication.

Professor Zeissl has also turned me upside down. You know that "man seit jeher gesagt hat," that a man with a hard chancre is not self-inoculable. Professor Zeissl has shown us several cases where there were simultaneously present on the same individual a hard chancre, a papulous eruption, and one or more secondary ulcers, which were the result of vaccination from the original ulcer. These secondary ulcers have all the gross appearances of a soft chancre, or of a "zerfallendes geschwür," as he calls it, but they do not become indurated. Sometimes, in order to get pus from the original hard chancre, he has to rake up the bottom of the chancre and make it suppurate. He says that it is easier to produce such an ulcer on a syphilitic person than to produce an ulcer on a well person by application of irritants to the skin. The only thing which remains is to try the pus from the secondary ulcer, and see if it also possesses syphilitic potency, and if it is able to convey syphilis to a well person. I think that Professor Zeissl suffers from a deep melancholy because the law will not allow him to experiment upon this point.

I suppose you understand the Vienna system of hospital service, and that while it has great advantages it also has some great disadvantages. You know that when a man is appointed to a ward here he is appointed for the year in and the year out, and that he has everything all to himself. Now this is all very nice for the lucky man, and this manner of appointment as a system must tend to develop and bring forward prominent men in the profession. This must be inevitable, because a man would have to be most extraordinarily dull who could have so much material at his command without learning something therefrom. And, on the other hand, a man of only ordinary abilities and an average capacity for observing ought, under such circumstances, to stand ahead of his less fortunately situated colleagues.

Oppolzer, Skoda, Türck, Hebra, Billroth, Spaeth, Braun are a noble list of names, and yet I estimate some of the men who are here to-day as more favored by opportunity than by brains or genius. Braun has an immense clinic and great reputation, but his reputation is not so great as that of Spiegelberg, who has in comparison a very inferior clinic, in Breslau.

This system is of wonderful advantage, therefore, to the few, but its great weakness, or perhaps you might say injustice, lies in its neglect of its own students. This system makes no provision for succession, and practically ignores all rising talent. The consequence is that when an emergency comes and a professor dies or steps out, there is a great excitement over his successor. There is no real training-school here, where men can be trained with a direct view to succession, as is the case with our hospitals at home. I have heard one young physician here, whese specialty is thoracic diseases, bitterly complain because the wards where he might study and profit are closed to him. Bamberger, with his immense clinic, will not allow this man to enjoy its benefits. The young physician in question is a docent, and has an out-clinic and does what he can there in a small way. Oppolzer was in his day somewhat more liberal, and allowed Pollitzer and Gruber to use his material for the study of the ear. The consequence is that Pollitzer and Gruber have wards of their own now, and are celebrated men, because they were encouraged and given opportunity for study. Most of the young men pick along as well as they are able as docents, and then go off to smaller universities as soon as they can get an appointment.

Here, again, the natural result of the system is inevitable. The young men emigrate, and find a berth where they can. When a professor dies, however, the school finds no man ready for his shoes, but must import somebody or call back one of their own ill-treated students. You know what a time they had last year when the attempt was made to bring Recklinghausen here.

The more I consider the subject, therefore, the more I am convinced of the superiority of the Boston system of hospital service over that of Vienna. The one-man system here may produce more noise in the world, but the tendency of our system is certainly toward a better rank and file of men. Six men at home enjoy in alternation what one man rules here alone. And our training school — the out-patient department — is so ordered and carried on that there can never be any cause for worry about succession.

A certain number of young men are appointed as assistants here, but from the stupidity of some of them I imagine that they have obtained their appointments from other considerations than that of their brains. Some of them, however, are very able young men, and are better teachers than some of the professors, because they are more interested in their work.

WEEKLY BULLETIN OF PREVALENT DISEASES.

THE following is a bulletin of the diseases prevalent in Massachusetts during the week ending April 3, 1875, compiled under the authority of the State Board of Health from the returns of physicians representing all sections of the State: —

In Berkshire: influenza, bronchitis, rheumatism, and pneumonia. Diphtheria is increasing in prevalence. In Lee there were four cases of varioloid.

In the Connecticut Valley, the same diseases prevail as in Berkshire. In many of the towns, acute affections of the digestive organs (diarrhœa, cholera morbus, and bilious disorders) have manifested a sudden prevalence.

In Worcester County: influenza, bronchitis, measles, rheumatism, and pneumonia. Diphtheria is still prevalent, but less so than a week ago. In Douglas, "some cases of varioloid."

In the Northeastern section: pneumonia, bronchitis, scarlatina, and rheumatism. Measles has subsided and scarlatina has increased. In Reading is a single case of small-pox, supposed to have been imported from Canada. In Ashby, measles is epidemic.

In Boston and its suburbs: bronchitis, measles, rheumatism, pneumonia, and scarlatina. Intestinal affections are increasing in prevalence. Typhoid is also on the increase.

On the Cape: bronchitis, influenza, rheumatism, and pneumonia.

Since last week, in the State at large, bronchitis, measles, diphtheria, croup, rheumatism, and pneumonia have diminished in prevalence. Intestinal disorders, influenza, scarlatina, and whooping-cough have increased.

F. W. DRAPER, M. D., Registrar.

COMPARATIVE MORTALITY-RATES FOR THE WEEK ENDING MARCH 27, 1875.

	Estimated Population.	Total Mortality for the Week.	Annual Death-rate per 1000 during Week.
New York	1,040,000	605	30
Philadelphia	775,000	357	24
Brooklyn	450,000	199	25
Boston	350,000	170	25
Providence	100,000	28	15
Worcester	50,000	19	20
Lowell	50,000	22	23
Cambridge	44,000	21	25
Fall River	34,200	16	24
Lawrence	33,000	15	24
Springfield	33,000	12	19
Lynn	28,000	7	13
Salem	26,000	10	20

THE AMERICAN MEDICAL ASSOCIATION.

The twenty-sixth annual session of the American Medical Association will be held in the city of Louisville, Ky., on Tuesday, May 4, 1875, at 11 A. M.

"The delegates shall receive their appointment from permanently organized State medical societies, and such county and district medical societies as are recognized by representation in their respective State societies, and from the medical department of the Army and Navy of the United States."

"Each State, county, and district medical society entitled to representation shall have the privilege of sending to the association one delegate for every ten of its regular resident members, and one for every additional fraction of more than half that number: *Provided*, however, that the number of delegates for any particular State, Territory, county, city, or town shall not exceed the ratio of one in ten of the resident physicians who may have signed the code of ethics of the association."

The following amendments to the plan of organization are to be acted upon: —

By Dr. H. B. Baker, Michigan:—

"The officers of the several sections shall be nominated by the section in and for which said officers are to serve."

By Dr. Adams Jewett, Ohio: —

"The permanent members shall consist of all those who have served in the capacity of delegates, and of such other members as shall have received the appointment by unanimous vote, and of all others who, being members in good standing of any State or local medical society entitled to representation in this body, shall, after being vouched for by at least three members, be elected to membership by a vote of three fourths of the delegates in attendance, and shall continue such so long as they remain in good standing in the body of which they were members when elected to membership in this association, and comply with the requirements of its by-laws."

Secretaries of all State medical societies that have adopted the code of ethics are respectfully requested to forward to the Permanent Secretary, Wm. B. Atkinson, M. D., Philadelphia, a complete list of the officers, with their post office addresses, of those county and district medical societies entitled to representation in their respective bodies.